WHAT IS CLAIMED

1. For use with an electrical apparatus employing a signal transport path having a first node coupled with a reference frequency signal source that is operative to generate a reference frequency signal that propagates along said signal transport path to a second node, said signal transport path imparting a variable delay of said reference frequency signal employed by said apparatus to operate electrical devices at said nodes, as a result of temperature variation along said signal transport path, a method of providing a measure of delay through said signal transport path between said first node and said second node, said method comprising the steps of:

(a) injecting a chirp signal into said signal transport path from said second node of said signal transport path, so that said chirp signal is transmitted over said signal transport path, is reflected from said first node and returned to said second node of said apparatus;

(b) receiving said reflected chirp signal at said second node of said apparatus;

(c) correlating energy contained in said reflected chirp signal received in step (b) with energy in an auxiliary chirp signal, delayed with respect to that of the chirp signal injected into said signal transport path in step (a); and

(d) adjusting said auxiliary chirp signal to maximize the result of correlating in step (c) and

thereby provide an output representative of delay through said signal transport path.

2. The method according to claim 1, further including a reference frequency bandpass filter coupled with said first node and being operative to pass said reference frequency signal and reflect said chirp signal, and wherein step (a) comprises injecting said chirp signal into said signal transport path from said second node, so that said chirp signal is transmitted over said signal transport path and is reflected from said bandpass filter, and step (b) comprises receiving said reflected RF chirp signal via a reference bandpass filter at said second node.

3. The method according to claim 2, wherein step (a) comprises generating said chirp signal by means of a direct digital synthesizer into said signal transport path from said second node, so that said digitally synthesized chirp signal is transmitted over said signal transport path and is reflected from said transmit bandpass filter, and wherein said auxiliary chirp signal of step (c) is generated by means of an auxiliary chirp signal generator that is operative to generate said auxiliary chirp delayed relative to said injected chirp signal of step (a).

4. The method according to claim 3, wherein step (d) comprises adjusting the amount of delay by way of

which said auxiliary chirp signal is delayed relative the chirp signal generated in step (a) to maximize the result of correlating in step (c) and thereby provide an output representative of delay through said signal transport path.

5. The method according to claim 1, wherein said electrical apparatus comprises a phased array antenna, and said first node comprises one transmit/receive antenna array and said second node comprises a second transmit/receive antenna array.

6. An arrangement for providing a measure of phase delay through a signal transport path for a reference frequency signal that is conveyed thereover between first and second nodes of an electrical apparatus, comprising:

a chirp signal generator which is operative to inject an upstream-directed chirp signal into said signal transport path from said second node of said apparatus, so that said chirp signal is transmitted over said signal transport path, is reflected from said first node, and returns to said second node;

a reflected chirp signal receiver coupled with said second node, and being operative to extract energy in said chirp signal that has reflected from said first node, and returned to said second node;

a correlator that is operative to correlate energy contained in said reflected chirp signal with energy in

an auxiliary chirp signal, delayed with respect to that of the RF chirp signal injected into said signal transport path; and

an auxiliary chirp signal adjustment unit, which is operative to adjust said auxiliary chirp signal to maximize the output of said correlator and thereby provide an output representative of delay through said signal transport path.

7. The arrangement according to claim 6, wherein said first node includes an upstream bandpass filter from which said injected chirp signal is reflected and returned to said second node, and wherein said second node includes a downstream bandpass filter operative to pass said injected chirp signal as reflected by said upstream bandpass filter and returned to said second node.

8. The arrangement according to claim 7, wherein said chirp signal generator comprises a direct digital synthesizer, and wherein said auxiliary chirp signal adjustment unit comprises an auxiliary chirp signal generator operative to generate said auxiliary chirp delayed relative to said injected chirp signal generated by said direct digital synthesizer.

9. The arrangement according to claim 7, wherein said apparatus comprises a phased array antenna, and wherein said first node is coupled with one

transmit/receive antenna array and said second node is coupled with a second transmit/receive antenna array.

10. For use with a phased array antenna having a signal transport path between transmit/receive array portions of said antenna, said signal transport path being subject to a variable delay therethrough, of a reference frequency signal employed by said antenna to operate said transmit/receive array portions thereof, as a result of temperature variations along said signal transport path, a method of providing a measure of said variable delay through said signal transport path comprising the steps of:

(a) at said remote portion of said antenna, injecting a chirp signal into said signal transport path so that said chirp signal is transmitted over said signal transport path and is reflected from said local transmit/receive portion of said antenna;

(b) extracting said reflected chirp signal at said receive portion of said antenna and correlating energy contained in said reflected chirp signal with energy in an auxiliary chirp signal that is delayed with respect to that of the chirp signal injected into said signal transport path in step (a);

(c) adjusting said auxiliary chirp signal to maximize its correlation with said reflected chirp signal and producing an output representative of phase delay of said reference frequency signal through said signal transport path.

11. The method according to claim 10, wherein said transmit/receive portion of said antenna contains a reference bandpass filter that is operative to pass said reference frequency signal but reflect said chirp signal, and wherein step (b) comprises receiving said reflected chirp signal via a reference frequency bandpass filter at said receive portion of said antenna.

12. The method according to claim 11, wherein step (a) comprises generating said chirp signal by means of a direct digital synthesizer into said signal transport path from said receive portion of said antenna, so that said digitally synthesized chirp signal is transmitted over said signal transport path and is reflected from said reference frequency bandpass filter, and wherein said auxiliary chirp signal is generated by means of an auxiliary chirp signal generator that is operative to generate said auxiliary chirp delayed relative to said injected chirp signal of step (a).

13. The method according to claim 12, wherein step (c) comprises adjusting the amount of delay, by way of which said auxiliary chirp signal is delayed relative to the chirp signal generated in step (a), to maximize the result of correlating in step (b) and thereby provide an output representative of delay of said reference frequency signal through said signal transport path.